CLAIMS

1. A method of modeling and simulating a biological system comprising one or more tangible biological functional entities modeled by at least:

- a morphological occurrence comprising at least a biochemical constituent that identifies the persistent properties of the biological functional entity, and at least a transformation representing the way in which that constituent behaves as a function of the space-time context;
- a spatial occurrence representing at least a spatial characteristic of the biological functional entity; and
- a temporal occurrence representing at least a temporal characteristic of the biological functional entity;

which method simulates the behavior of said biological functional entities by recursively determining the effect on their functioning and on their behavior (their activities) of all changes affecting said occurrences, including transformations.

2. A method according to claim 1, wherein the temporal occurrence is selected from an age of the biological functional entity and a period during which that functional entity is active.

3. A method according to claim 1 or claim 2, wherein said biological constituent is selected from an organism, a tissue, a cell, an organite, and a molecule.

4. A method according to any preceding claim, wherein said transformation is selected from a cellular transformation and a molecular transformation.

5. A method according to any preceding claim, wherein said transformation is a molecular transformation

selected from:

- a covalent molecular transformation, itself selected from a covalent transformation of proteins corresponding to a post-traductional transformation or a co-traductional transformation, a covalent RNA transformation corresponding to RNA synthesis or maturation, and a covalent DNA transformation corresponding to DNA synthesis, damage or repair; and
- a non-covalent transformation itself selected from a hydrophobic transformation, a transformation caused by Van der Waals forces, electrostatic forces or attraction between an electronegative atom of one molecule and a hydrogen atom of another molecule, and a steric transformation caused by attraction between adjacent atoms.

6. A method according to any preceding claim, wherein some of said function biological entities are included in a higher biological functional entity.

7. A method according to any preceding claim, wherein at least some of said biological functional entities include lower biological functional entities.

8. A method according to any preceding claim, wherein at least some functional entities constitute the environment of at least some other functional entities with which they interact.

9. A method according to any preceding claim, wherein the biological system further comprises intangible biological functional entities modeled by temporal occurrences and where applicable spatial and morphological occurrences.

10. A method according to claim 9, wherein said intangible biological functional entities comprise biochemical reactions.

11. A model for implementing a method according to any preceding claim, the model comprising one or more tangible biological functional entities modeled by at least:

- a morphological occurrence comprising at least a biochemical constituent that identifies the biological functional entity, and at least a transformation representing the way in which that constituent behaves as a function of the space-time context;
- a spatial occurrence representing at least a spatial characteristic of the biological functional entity; and
- a temporal occurrence representing at least a temporal characteristic of the biological functional entity.